

REMARKS

The Office Action mailed March 22, 2004 has been carefully reviewed and the following remarks have been made in consequence thereof.

Claims 11, 14, 15, and 17-20 are pending in this application. Claims 11, 13-15, and 17-20 stand rejected. Claims 1-10, 12, 13, and 16 have been cancelled.

The rejection of Claim 11 under 35 U.S.C. 103(a) as being unpatentable over Cairns et al. (U.S. Pat. No. 3,781,205) in view of McDonald et al. (W/O No. 98/58986) is respectfully traversed.

Cairns et al. describe a composite bearing structure including a backing member to which is secured a high tensile strength, dimensionally stable bearing surface layer. The bearing surface layer includes a solid lubricant and a plurality of fibers of a material characterized by a heat distortion temperature exceeding that of polytetrafluoroethylene (PTFE), and selected from aromatic polyamides, carbon, graphite, aromatic polysulfones, aromatic polyimides, and aromatic polyester-imides. The solid lubricant is selected from the sulfides, selenides and tellurides of molybdenum, tungsten, and titanium, lead dioxide, boron nitride, and carbon, graphite, or PTFE. At column 3, lines 43-46, Cairns et al. recites that the materials used in fabricating the bearing layers, i.e., the yarns or threads, may be "preimpregnated with a suitable resin impregnate adhesive to facilitate bonding...."

McDonald et al. describe a method of manufacturing a bearing material for use in a bearing. The method includes forming a water-based slurry including a percentage of filler material, wherein the filler material may include inorganic fibers such as glass or carbon fibers, and spreading a layer of the slurry onto a substrate to form a deposited matrix layer about which fluoro-polymer and filler materials are retained. In the exemplary embodiment, PTFE is used as the fluoro-polymer, and the filler materials may include glass or carbon fibers or polymers such as polyimide. The deposited layer, known as the bearing material layer, is then coupled to a backing and heated to cure the fluoro-polymer. In one embodiment, the deposited layer is coupled to the backing with an adhesive, and if necessary,

at page 9, lines 14-17, McDonald recites that “the bearing material may require a pre-treatment such as chemical etching, plasma pre-treatment....”

Initially, Applicants respectfully disagree with the assertion within the Office Action, at page 12 that Cairns clearly suggests that each of the bearing elements is impregnated with resin. Rather, Applicants submit that at Col. 3, lines 43-46, Cairns recites that the materials used in fabricating the bearing layers, i.e., the yarns or threads, may be “preimpregnated with a suitable resin impregnate adhesive to facilitate bonding with the backing member.” Accordingly, Cairns does not describe nor suggest that the **bearing layers** are impregnated with a suitable resin, as is recited in Claim 11, but rather that the **materials used in fabricating** each layer may be preimpregnated with a suitable resin.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. As is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. Applicants again reiterate that no combination of Cairns et al. and McDonald et al. describes or suggests the claimed combination.

Moreover, Applicants respectfully resubmit that the combination of Cairns et al. and McDonald teaches away from the present invention, and accordingly, such a teaching supports the nonobviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. Specifically, Applicants respectfully submit that no combination of Cairns et al. and McDonald describes or suggests a method for manufacturing a bearing element wherein each layer is formed from a plurality of fibers, wherein each layer is plasma etched and each layer is impregnated with a polyimide resin comprising polytetrafluoroethylene powder. More specifically, Cairn et al. describe preimpregnating the yarns or threads used in fabricating the bearing layers to facilitate bonding, and in contrast to Cairns et al., McDonald describes a bearing element that includes only one element which may require plasma-treating to facilitate bonding. Accordingly, Applicants respectfully

submit that no combination of Cairns et al. and McDonald suggests plasma etching each layer to facilitate bonding adjacent layers.

In addition, and to the extent understood, no combination of Cairns et al. and McDonald et al., describes or suggests the claimed invention. Specifically, Claim 11 recites a method for manufacturing a bearing element wherein the method comprises “forming a plurality of layers from a combination of a first material and a second material...forming the bearing element from the plurality of layers...plasma etching each of the bearing element plurality of layers to facilitate enhancing bonding between adjacent layers...impregnating each of the bearing element plurality of layers with a polyimide resin comprising polytetrafluoroethylene powder.” Specifically, no combination of Cairns et al. and McDonald et al. describes or suggests plasma etching **each** of the bearing element layers to facilitate enhancing bonding between adjacent layers, in combination with impregnating each of the bearing element plurality of layers with a polyimide resin. Rather, in contrast to the present invention, Cairns et al. describe preimpregnating the yarns or threads used in fabricating the bearing layers to facilitate bonding, and does not suggest nor describe plasma etching, and McDonald describes a bearing element that includes only one element which may require plasma-treating to facilitate bonding, but does not suggest nor describe impregnating any layer with a polyimide resin. Accordingly, for at least the reasons set forth above, Claim 11 is submitted to be patentable over Cairns et al. in view of McDonald et al.

For the reasons set forth above, Applicant respectfully requests that the Section 103 rejection of Claim 11 be withdrawn.

The rejection of Claims 11, 13-15, 17, 19, and 20 under 35 U.S.C. § 103 as being unpatentable over Stanley et al. (GB 2,095,170) in view of Cairns et al. and McDonald et al. is respectfully traversed.

Cairns et al. and McDonald et al. are described above. Stanley et al. describe a composite article 10 in the form of a molded laminate bushing for use, for example, in a variable stator vane assembly. Bushing 10 is fabricated with a pair of outer bearing portions 12 and an intermediate lamination 14. Each lamination 12 is a compound woven fabric such as glass fibers and interwoven low friction fiber material such as PTFE fibers. Lamination 14

is a glass fiber element such as glass fiber clot. At column 1 line 63, through column 2, line 69, Stanley et al. recite that the “low friction fiber material, in most cases, does not readily bond with the material of the body 14, and in order to assure a good bond, the bondable fibers are woven on the reverse...so that on the inner surface 17 a readily bondable surface will be provided.”

As described above, Applicants again respectfully disagree with the assertion within the Office Action, at page 12 that Cairns clearly suggests that each of the bearing elements is impregnated with resin. Moreover, Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. As is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. Applicants again reiterate that no combination of Stanley, Cairns et al. and McDonald et al. describes or suggests the claimed combination.

Moreover, Applicants respectfully resubmit that the combination of Stanley, Cairns et al. and McDonald teaches away from the present invention, and accordingly, such a teaching supports the nonobviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. Specifically, Applicants respectfully submit that no combination of Stanley, Cairns et al. and McDonald describes or suggests a method for manufacturing a bearing element wherein each layer is formed from a plurality of fibers, wherein each layer is plasma etched and each layer is impregnated with a polyimide resin comprising polytetrafluoroethylene powder. More specifically, Cairn et al. describe preimpregnating the yarns or threads used in fabricating the bearing layers to facilitate bonding, and in contrast to Cairns et al., McDonald describes a bearing element that includes only one element which may require plasma-treating to facilitate bonding, and Stanley impregnating the bearing laminate with a cured resin consisting of epoxies and polyimides to facilitate bonding. Accordingly, Applicants respectfully submit that no combination of Stanley, Cairns et al. and McDonald suggests plasma etching each layer to facilitate bonding adjacent layers.

In addition, and to the extent understood, no combination of Stanley, Cairns et al. and McDonald et al., describes or suggests the claimed invention. Specifically, Claim 11 recites a method for manufacturing a bearing element wherein the method comprises “forming a plurality of layers from a combination of a first material and a second material...forming the bearing element from the plurality of layers...plasma etching each of the bearing element plurality of layers to facilitate enhancing bonding between adjacent layers...impregnating each of the bearing element plurality of layers with a polyimide resin comprising polytetrafluoroethylene powder.” Specifically, no combination of Stanley, Cairns et al. and McDonald et al. describes or suggests plasma etching **each** of the bearing element layers to facilitate enhancing bonding between adjacent layers, in combination with impregnating each of the bearing element plurality of layers with a polyimide resin. Rather, in contrast to the present invention, Stanley et al. describes a specific means of weaving fibers to create “a readably bondable surface”, rather than using plasma etching, Cairns et al. describe preimpregnating the yarns or threads used in fabricating the bearing layers to facilitate bonding, and does not suggest nor describe plasma etching, and McDonald describes a bearing element that includes only one element which may require plasma-treating to facilitate bonding, but does not suggest nor describe impregnating any layer with a polyimide resin. Accordingly, for at least the reasons set forth above, Claim 11 is submitted to be patentable over Stanley in view of Cairns et al. and McDonald et al.

For the reasons set forth above, Applicant respectfully requests that the Section 103 rejection of Claim 11 be withdrawn.

Claims 13-15, 17, 19, and 20 depend directly or indirectly from independent Claim 11. When the recitations of Claims 13-15, 17, 19, and 20 are considered in combination with the recitations of Claim 11, Applicant submits that dependent Claim 13-15, 17, 19, and 20 likewise are patentable over Stanley et al. in view of Cairns et al. and McDonald et al.

For the reasons set forth above, Applicant respectfully requests that the Section 103 rejection of Claims 11, 13-15, 17, 19, and 20 be withdrawn.

The rejection of Claims 11, 13-15, 17, 19, and 20 under 35 U.S.C. § 103 as being unpatentable over Stanley et al. in view of McCloskey (U.S. Pat. No. 4,111,499) and McDonald et al. is respectfully traversed.

Stanley et al. and McDonald are described above. McCloskey describes a bearing liner formed of a mixture of thermosetting blended and unblended resins and particles of a self-lubricating, heat resistant plastic material, such as Teflon. The resin material is attached to a woven fabric formed of a plurality of materials including Dacron, Nomex, fiberglass, or aluminum foil. Pressure and heat are applied to cure the bearing liner and to lock the Teflon particles within the cured resin. At column 5, lines 1-3, McCloskey recites that “the Teflon particles are locked in the cured resin...the liner does not exhibit the “spring” which characterized prior art woven fabric liners.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. As is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. No combination of Stanley et al., McCloskey, and McDonald et al. describes or suggests the claimed combination. Additionally, the Examiner has not pointed to any prior art that teaches or suggests to combine the disclosures, other than Applicants’ own teaching. Rather, only the conclusory statement that “it would have been obvious to one of ordinary skill in the art at the time the invention, to have formed the bearing of Stanley et al. using a polyimide resin comprising PTFE particles, in light of the teachings of McCloskey” suggests combining the disclosures.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. As is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. Applicants again reiterate that no combination of Stanley et al., McCloskey, and McDonald et al. describes or suggests the claimed combination.

Moreover, Applicants respectfully resubmit that the combination of Stanley et al., McCloskey, and McDonald et al. teaches away from the present invention, and accordingly, such a teaching supports the nonobviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. Specifically, Applicants respectfully submit that no combination of Stanley et al., McCloskey, and McDonald et al. describes or suggests a method for manufacturing a bearing element wherein each layer is formed from a plurality of fibers, wherein each layer is plasma etched and each layer is impregnated with a polyimide resin comprising polytetrafluoroethylene powder. More specifically, McDonald describes a bearing element in which only one element is suggested as requiring plasma-treating to facilitate bonding, and both Stanley et al. and McCloskey describe means to bond the bearing surfaces without the use of plasma etching.

In addition, and to the extent understood, no combination of Stanley et al., McCloskey, and McDonald et al. describes or suggests the claimed invention. Specifically, Claim 11 recites a method for manufacturing a bearing element wherein the method comprises “forming a plurality of layers from a combination of a first material and a second material...forming the bearing element from the plurality of layers...plasma etching each of the bearing element plurality of layers to facilitate enhancing bonding between adjacent layers...impregnating each of the bearing element plurality of layers with a polyimide resin comprising polytetrafluoroethylene powder.” Specifically, no combination of Stanley et al., McCloskey, and McDonald et al. describes or suggests plasma etching **each** of the bearing element layers to facilitate enhancing bonding between adjacent layers, in combination with impregnating each of the bearing element plurality of layers with a polyimide resin. Rather, in contrast to the present invention, Stanley et al. describes a specific means of weaving fibers to create “a readably bondable surface”, rather than using plasma etching, McCloskey describes a bearing liner formed after a plurality of layers of materials are compressed into each other without being plasma etched, and McDonald et al. describe a bearing element including that is fabricated with only one specific layer being plasma pre-treated to facilitate that layer being secured against a backing layer. Accordingly, for at least the reasons set

forth above, Claim 11 is submitted to be patentable over Stanley in view of McCloskey and McDonald et al.

For the reasons set forth above, Applicant respectfully requests that the Section 103 rejection of Claim 11 be withdrawn.

Claims 13-15, 17, 19, and 20 depend directly or indirectly from independent Claim 11. When the recitations of Claims 13-15, 17, 19, and 20 are considered in combination with the recitations of Claim 11, Applicant submits that dependent Claim 13-15, 17, 19, and 20 likewise are patentable over Stanley et al. in view of McCloskey and McDonald et al.

For the reasons set forth above, Applicant respectfully requests that the Section 103 rejection of Claims 11, 13-15, 17, 19, and 20 be withdrawn.

The rejection of Claim 18 under 35 U.S.C. § 103 as being unpatentable over Stanley et al./Cairns et al./McDonald et al. and further in view of Viola et al. (U.S. Pat. No. 3,873,168) is respectfully traversed.

Stanley et al., Cairns et al., and McDonald et al., are described above. Viola et al. describe a washer 10 including a pair of outer bearing portions 12 and a body 14. In the preferred embodiment, body 14 is fabricated from a layer of woven glass and a pair of layers of woven graphite. Viola et al. recite that graphite fibers facilitate providing thermal insulation to washer 10. Bearing portions 12 are bonded to each side of body 14 by a resin that is impregnated in each portion 12 and body 14. In an alternative embodiment, carbon fibers replace the graphite fibers. To facilitate enhancing the life and anti-friction characteristics of the outer surface of washer 10, a coating 18 is applied to bearing portion 12.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. As is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. No combination of Stanley et al., Cairns et al., Viola et al., and McDonald et al. describes or suggests the claimed combination. Additionally, the Examiner has not pointed to any prior art that teaches or suggests to combine the disclosures, other than Applicants' own teaching. Rather, only the

conclusory statement that “it would have been obvious to one of ordinary skill in the art at the time the invention, to have formed the bearing of Stanley et al./Cairns et al./McDonald in light of the teachings of Viola et al., in order to provide a more wear resistant bearing” suggests combining the disclosures.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. As is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. Applicants again reiterate that no combination of combination of Stanley et al., Cairns et al., Viola et al., and McDonald et al. describes or suggests the claimed combination.

Moreover, Applicants respectfully resubmit that the combination of Stanley et al., Cairns et al., Viola et al., and McDonald et al. teaches away from the present invention, and accordingly, such a teaching supports the nonobviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. Specifically, Applicants respectfully submit that no combination of Stanley et al., Cairns et al., Viola et al., and McDonald et al. describes or suggests a method for manufacturing a bearing element wherein each layer is formed from a plurality of fibers, wherein each layer is plasma etched and each layer is impregnated with a polyimide resin.

In addition, and to the extent understood, no combination of Stanley et al., Cairns et al., Viola et al., and McDonald et al. describes or suggests the claimed invention. Specifically, Claim 11 recites a method for manufacturing a bearing element wherein the method comprises “forming a plurality of layers from a combination of a first material and a second material...forming the bearing element from the plurality of layers...plasma etching each of the bearing element plurality of layers to facilitate enhancing bonding between adjacent layers...impregnating each of the bearing element plurality of layers with a polyimide resin comprising polytetrafluoroethylene powder.” Specifically, no combination

of Stanley et al., Cairns et al., Viola et al., and McDonald et al. describes or suggests plasma etching **each** of the bearing element layers to facilitate enhancing bonding between adjacent layers, in combination with impregnating each of the bearing element plurality of layers with a polyimide resin. Rather, in contrast to the present invention, Stanley et al. describes a specific means of weaving fibers to create “a readably bondable surface”, rather than using plasma etching, Cairns et al. describe preimpregnating the yarns or threads used in fabricating the bearing layers to facilitate bonding, and does not suggest nor describe plasma etching, McCloskey describes a bearing liner formed after a plurality of layers of materials are compressed into each other without being plasma etched, and McDonald et al. describe a bearing element including that is fabricated with only one specific layer being plasma pre-treated to facilitate that layer being secured against a backing layer. Accordingly, for at least the reasons set forth above, Claim 11 is submitted to be patentable over Stanley et al. in view of Cairns et al. and Viola et al., and further in view of McDonald et al.

Claim 18 depends from independent Claim 11. When the recitations of Claim 18 are considered in combination with the recitations of Claim 11, Applicants submit that dependent Claim 18 likewise is patentable over Stanley et al. in view of Cairns et al. and Viola et al., and further in view of McDonald et al.

For the reasons set forth above, Applicant respectfully requests that the Section 103 rejection of Claim 18 be withdrawn.

The rejection of Claim 18 under 35 U.S.C. § 103 as being unpatentable over Stanley et al./McCloskey./McDonald et al. and further in view of Viola et al. is respectfully traversed.

Stanley et al., McCloskey, Viola et al., and McDonald et al., are described above.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. As is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. No combination of Stanley et al., McCloskey, McDonald et al., and Viola et al., describes or suggests the claimed combination. Additionally, the Examiner has not pointed to any prior art that teaches or suggests to combine the disclosures, other than Applicants’ own teaching. Rather, only the

conclusory statement that “it would have been obvious to one of ordinary skill in the art at the time the invention, to have formed the bearing of Stanley et al./McCloskeyMcDonald in light of the teachings of Viola et al., in order to provide a more wear resistant bearing” suggests combining the disclosures.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. As is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. Applicants again reiterate that no combination of combination of Stanley et al., Cairns et al., Viola et al., and McDonald et al. describes or suggests the claimed combination.

Moreover, Applicants respectfully resubmit that the combination of Stanley et al., Cairns et al., Viola et al., and McDonald et al. teaches away from the present invention, and accordingly, such a teaching supports the nonobviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. Specifically, Applicants respectfully submit that no combination of Stanley et al., Cairns et al., Viola et al., and McDonald et al. describes or suggests a method for manufacturing a bearing element wherein each layer is formed from a plurality of fibers, wherein each layer is plasma etched and each layer is impregnated with a polyimide resin.

In addition, and to the extent understood, no combination of Stanley et al., Cairns et al., Viola et al., and McDonald et al. describes or suggests the claimed invention. Specifically, Claim 11 recites a method for manufacturing a bearing element wherein the method comprises “forming a plurality of layers from a combination of a first material and a second material...forming the bearing element from the plurality of layers...plasma etching each of the bearing element plurality of layers to facilitate enhancing bonding between adjacent layers...impregnating each of the bearing element plurality of layers with a polyimide resin comprising polytetrafluoroethylene powder.” Specifically, no combination

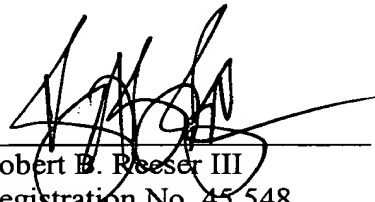
of Stanley et al., Cairns et al., Viola et al., and McDonald et al. describes or suggests plasma etching **each** of the bearing element layers to facilitate enhancing bonding between adjacent layers, in combination with impregnating each of the bearing element plurality of layers with a polyimide resin. Accordingly, for at least the reasons set forth above, Claim 11 is submitted to be patentable over Stanley et al. in view of McCloskey and Viola et al., and further in view of McDonald et al.

Claim 18 depends from independent Claim 11. When the recitations of Claim 18 are considered in combination with the recitations of Claim 11, Applicants submit that dependent Claim 18 likewise is patentable over Stanley et al. in view of McCloskey and Viola et al., and further in view of McDonald et al.

For the reasons set forth above, Applicant respectfully requests that the Section 103 rejection of Claim 18 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read 'Robert E. Reeser III', is written over a horizontal line.

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